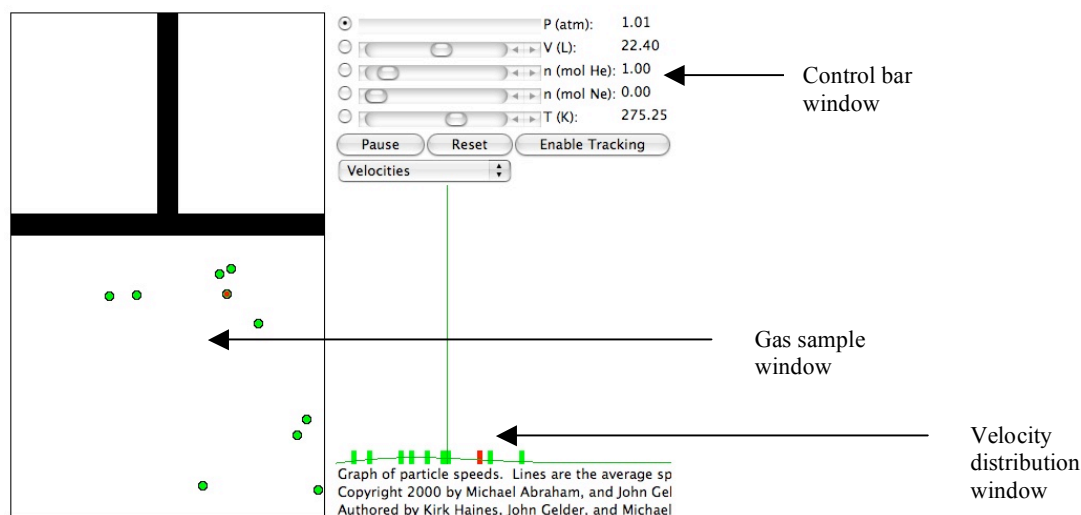


GAS LAWS COMPUTER SIMULATIONS LAB

Go to <http://intro.chem.okstate.edu/NSFCCLI/GasLaw/GLP.htm>



1. Open the Gas Law Simulation program and describe the motion of the gas particles in the Gas Sample Window. Use the words particles, velocity, collisions, and force in your description.
2. Click "Pressure" in the Control Bar Window to set pressure as the dependent variable. Then, slide the "Volume" bar to increase or decrease volume. What happens to pressure as volume decreases?
3. Observe the action of the gas atoms as volume decreases. How does the behavior of the gas atoms change as volume decreases?
4. Click "Reset" to return to standard temperature and pressure values. With "Pressure" still selected as the dependent variable, slide the "Temperature" bar to increase or decrease temperature. What happens to pressure as temperature increases?

5. Observe the action of the gas atoms as the temperature increases. How does the behavior of the gas atoms change as the temperature increases?

6. Click “Reset” to return to standard temperature and pressure values. Now, select “Volume” as the dependent variable and slide the temperature bar to increase and decrease temperature. What happens to volume as temperature increases? What kind of container (in the real world) would you need in order for this to happen?

7. Based upon your observations up to this point, how do gas atoms create pressure?

GRAPHING DATA

8. Click the reset button and reselect “Pressure” as the dependent variable. Slide “Volume” down to its lowest point. Record both values below. Then, slide the volume bar up incrementally, and record the corresponding pressure. Repeat this process 10 more times to get 12 data points.

Volume (L) x-axis	Pressure (atm) y-axis

Type your data into an Excel spreadsheet, just as shown in the table at the left. Then, create a graph of the data, and:

- Label the axes
- Add a trend line
- Display the equation for the line, and the R^2 value for the line
- Name the graph “P vs. V Simulation”

Remember there are instructions for Excel graphing on the References page of my wiki!

9. What gas law does this graph illustrate? Is the relationship between pressure and volume direct or inverse? What is the equation for this gas law? (Use your notes to help you!)

10. Click the reset button and reselect “Pressure” as the dependent variable. Slide “Temperature” down to its lowest point. Record both values below. Then, slide the temperature bar up incrementally, and record the corresponding pressure. Repeat this process 10 more times to get 12 data points.

Temperature (K) x-axis	Pressure (atm) y-axis

Type your data into an Excel spreadsheet, just as shown in the table at the left. Then, create a graph of the data, and:

- Label the axes
- Add a trend line
- Display the equation for the line, and the R^2 value for the line
- Name the graph “P vs. T Simulation”

Remember there are instructions for Excel graphing on the References page of my wiki!

11. What gas law does this graph illustrate? Is the relationship between pressure and temperature direct or inverse? What is the equation for this gas law? (Use your notes to help you!)

12. Click the reset button and reselect “Volume” as the dependent variable. Slide “Temperature” down to its lowest point. Record both values below. Then, slide the temperature bar up incrementally, and record the corresponding volume. Repeat this process 10 more times to get 12 data points.

Temperature (K) x-axis	Volume (L) y-axis

Type your data into an Excel spreadsheet, just as shown in the table at the left. Then, create a graph of the data, and:

- Label the axes
- Add a trend line
- Display the equation for the line, and the R^2 value for the line
- Name the graph “V vs. T Simulation”

Remember there are instructions for Excel graphing on the References page of my wiki!

13. What gas law does this graph illustrate? Is the relationship between volume and temperature direct or inverse? What is the equation for this gas law? (Use your notes to help you!)

14. In what kind of container could the effect of temperature on volume only be observed? Why?

Attach your Excel graphs to this packet.